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CASE REPORT

Case Report: melanoma and melanocytic nevus differentiation with reflectance confocal microscopy. [version 1; peer review: 3 approved]

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Abstract

Historically, melanoma has been typically diagnosed by naked-eye examination and confirmed with invasive biopsy. However, recently the use of reflectance confocal microscopy enables non-invasive bedside diagnosis of clinically equivocal lesions. We present a case in which reflectance confocal microscopy was used to evaluate two skin lesions in the same patient confirming the diagnosis of a melanoma and potentially avoiding invasive biopsy in the second benign melanocytic lesion. Clinicians should be aware of the availability of new non-invasive technologies that can aid in early diagnosis of malignant skin tumors and potentially reduce the number of benign lesion excisions.

Keywords

Reflectance confocal microscopy, Melanoma, Dysplasia, Nevi, Dermatology

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Any reports and responses or comments on the article can be found at the end of the article.

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Introduction

We report a case of a patient with multiple atypical melanocytic nevi evaluated with dermoscopy and reflectance confocal microscopy during a referral skin cancer control visit.

Background

Skin tumor diagnosis can be difficult due to the variable clinical presentation of skin lesions. In order to correctly identify melanoma at its earliest stage, the use of dermoscopy has been shown to significantly increase the sensitivity and specificity of diagnosis when compared to traditional naked-eye examination^{1,2}. In equivocal cases benign lesions may be excised when further cytological information is required to rule out malignancy. Recently reflectance confocal microscopy (RCM) use in clinical practice has been shown to further improve early melanoma diagnosis non-invasively by providing an *in-vivo* optical biopsy at histologic resolution down to a depth of 200 μm of skin tissue³⁻⁷. Moreover RCM has been shown to significantly reduce the number of unnecessary excisions in different settings⁸⁻¹⁰.

In this article we review the clinical, dermoscopic, and RCM presentation of two lesions in the same patient controlled with the gold standard of histopathology diagnosis.

Case report

A 65 year old Caucasian female (Fitzpatrick skin type III) presented to the dermatology department at the University of Modena and Reggio Emilia (UNIMORE) with referral from a general

practitioner for two skin lesions. Her past medical history and family history were negative for melanoma. No other significant medical history was noted. The patient reported having several invasive biopsies of dysplastic nevi in the past, the last reported biopsy in 2012. In 2013 the patient had her last naked-eye skin cancer screening by a private dermatologist with no worrisome skin lesions identified or recommended for biopsy.

Clinical naked-eye examination findings

The patient presented with a high numerosity of multiple irregularly shaped nevi located mainly on the back and lower legs. Lesion number 1, located on the upper right back, presented with ABCD (asymmetry, irregular borders, multiple colors, diameter >6mm) positive criteria and was of highest concern as it was the largest solitary macule on the back. Lesion number 2, located on the upper left shoulder, also presented with ABCD (asymmetry, irregular borders, multiple colors, diameter >6mm) positive criteria (Figure 1A, B, D).

Digital dermoscopy findings

Dermoscopy evaluation was performed with both a handheld dermatoscope and sequential digital dermoscopy (videodermoscopy). Lesion 1 presented with dermoscopic findings including: asymmetry, irregular reticular network with areas of eccentric hyperpigmentation, blue-white areas, and peppering representing early regression (Figure 1C). Lesion 2 presented with dermoscopic findings including: asymmetry and eccentric hyperpigmented network (Figure 1E).

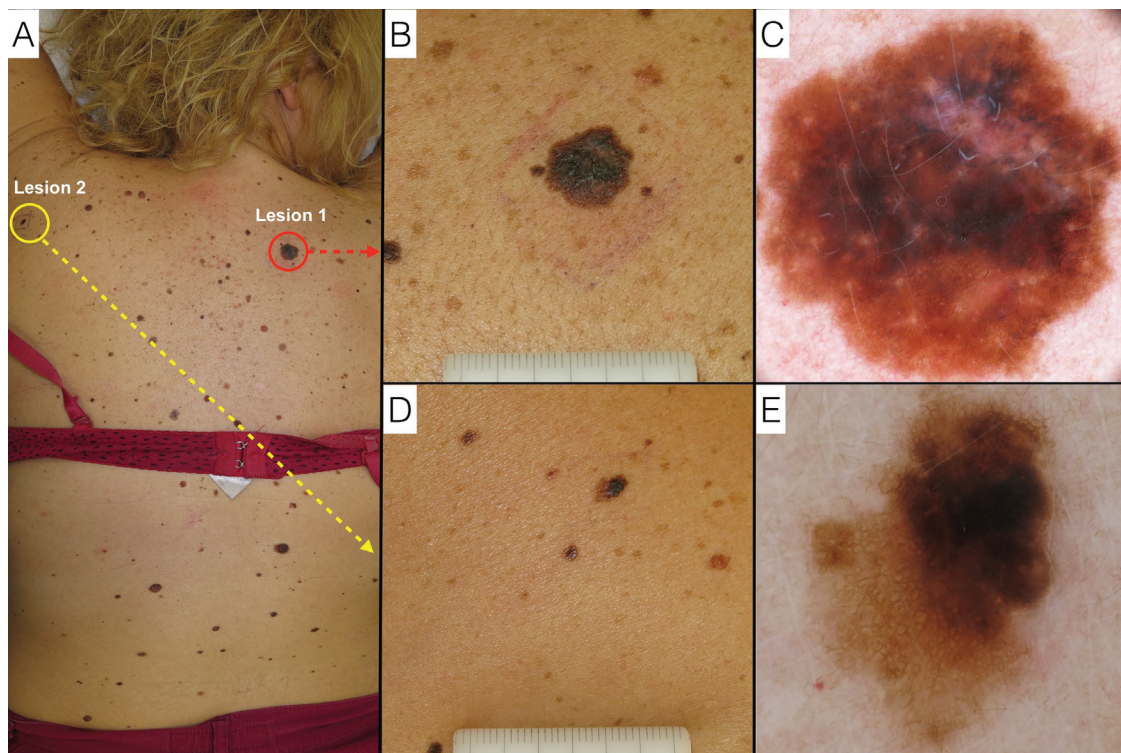


Figure 1. Melanoma and dysplastic nevus. A. Clinical overview of the patient. B. Lesion 1: Melanoma - naked-eye clinical close-up. C. Lesion 1: Melanoma - digital dermoscopy view. D. Lesion 2: Dysplastic nevus - naked-eye clinical close-up. E. Lesion 2: Dysplastic nevus - digital dermoscopy view.

Reflectance confocal microscopy findings

After dermoscopic evaluation and storage of both lesions in the UNIMORE digital dermoscopy database system the patient was referred for further evaluation with reflectance confocal microscopy. RCM images were obtained with a reflectance confocal microscope (Vivascope1500; MAVIG GmbH, Munich, Germany) using a 830 nm laser at a maximum power of 20 mW. RCM images of 0.5×0.5 mm were acquired with a lateral resolution of $1 \mu\text{m}$ and an axial resolution of $3\text{--}5 \mu\text{m}$ and stitched into composite images that covered between 4 to 8 square mm mosaics (VivaCube; MAVIG GmbH, Munich, Germany). A minimum of three mosaics were obtained at different depths, corresponding to the stratum granulosum/spinosum, the dermo-epidermal junction, and the papillary dermis.

Lesion number 1 presented with the following findings at the dermo-epidermal junction: predominant meshwork architecture composed of enlarged interpapillary spaces with junctional nests

containing atypical melanocytes. Additionally, there were areas of loss of architectural structure and replacement by non-specific architecture with bundles of atypical dendritic-type melanocytes. The epidermis presented with complete disarrangement with an atypical honeycombed pattern and presence of a high numerosity of heterogeneously shaped pagetoid cells (Figure 2). RCM examination was therefore confirming the diagnosis of melanoma, later confirmed by histopathology report.

Lesion number 2 presented with the following findings at the dermo-epidermal junction (DEJ): predominant ringed and clod architecture, representing junctional lentiginous proliferation of melanocytes and dermal nests respectively, with absence of atypical cells. Additionally at the DEJ there were few areas of meshwork architecture. The epidermis presented with a regular honeycombed pattern with few inflammatory cells (Figure 3). RCM examination was therefore suggestive of a dysplastic nevus, later confirmed by histopathology report.

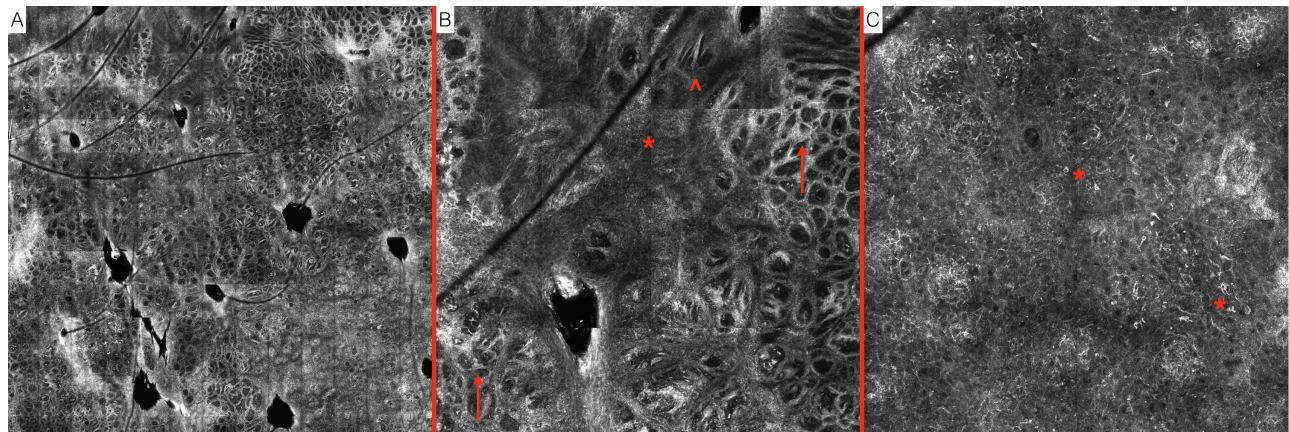


Figure 2. Melanoma. Reflectance confocal microscopy (RCM) imaging. **A.** Mosaic-map overview. **B.** Presence of non-specific pattern (*), atypical meshwork pattern (↑), aggregates of dendritic-type atypical melanocytes in bundles (△), location: dermo-epidermal junction. **C.** Disarrangement of the epidermis with an atypical honeycombed pattern and presence of a high numerosity of heterogeneously shaped pagetoid cells (*), location: epidermis.

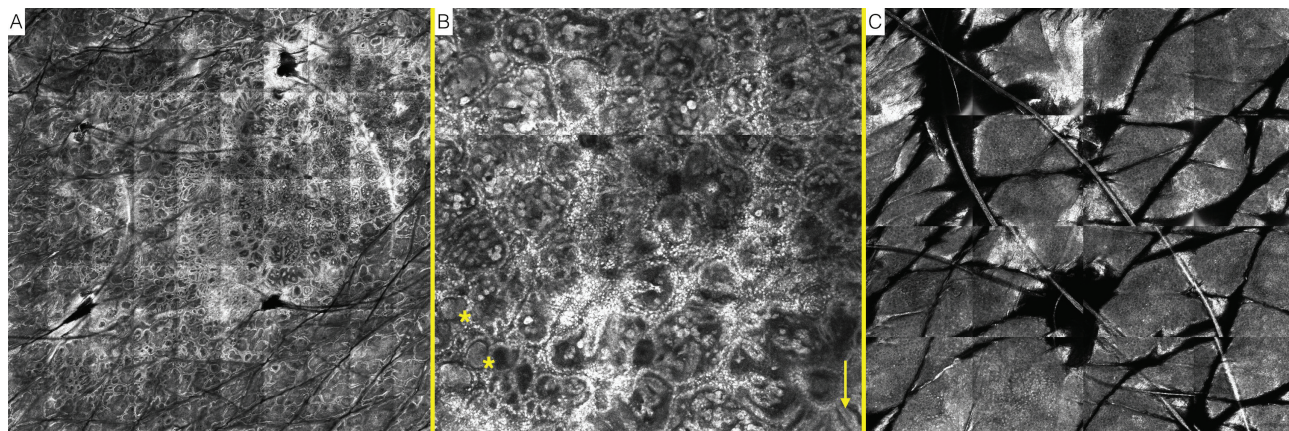


Figure 3. Dysplastic nevus. Reflectance confocal microscopy (RCM) imaging. **A.** Mosaic-map overview. **B.** Presence of ringed and clod (*) architecture, representing junctional lentiginous proliferation of melanocytes and dermal nests respectively, location: dermo-epidermal junction. **C.** Regular honeycombed pattern with few inflammatory cells, location: epidermis.

Discussion

The purpose of our case-report was to present a typical scenario encountered by clinicians in daily practice where multiple lesions are referred for skin cancer examination. The methodology of full body dermoscopy evaluation to identify potentially high risk skin lesions and further evaluation with RCM imaging provides trained experts with cellular information about skin lesions non-invasively at the bedside. Ultimately this information can aid in early diagnosis of malignant skin tumors and moreover potentially reduce removal of benign lesions, saving patients from unnecessary scarring and healthcare costs. In the case of our patient after RCM evaluation was performed it was recommended to the patient to remove the melanoma (lesion 1) and to follow-up the melanocytic nevus (lesion 2) with annual sequential digital dermoscopy (videodermoscopy) evaluation. Due to the patient's request and concern both lesions were removed and sent for histopathology evaluation where lesion 1 was confirmed to be a melanoma (0.62 mm depth) and lesion 2 a dysplastic nevus. In conclusion, this case is a classic example where implementation of non-invasive screening methods can help confirm tumor diagnosis immediately at the bedside and help to reduce the waiting time for necessary removal

of a melanoma and potentially reduce the unnecessary excision of a dysplastic nevus.

Consent

Written informed consent for publication of patient clinical details and/or clinical/digital dermoscopy/RCM images was obtained from the patient.

Author contributions

JL and AW conceived the case-report. AW carried out patient examination and image collection. JL and GP contributed to the design and preparation of the manuscript. All authors were involved in the revision of the draft manuscript and have agreed to the final content.

Competing interests

No competing interests were disclosed.

Grant information

The author(s) declared that no grants were involved in supporting this work.

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In my eye, the manuscript is very good. I wonder if the Authors could provide the histological images of the cases in order to achieve a greater completeness in their report.

In the background section, 3rd sentence, 'cytological information' should be changed into 'histopathological information'.

I have no additional comment other than congratulating with the authors for their work.

Competing Interests: No competing interests were disclosed.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 23 July 2015

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This is a nice concise case report to increase our awareness of the availability of the new non-invasive tool (RCM), which can aid in early diagnosis of melanoma and hence, reducing the number of benign lesions excision especially for patients with atypical melanocytic nevi syndrome.

The knowledge added is limited but useful for other practitioners.

The title, abstract, article content and overall discussions are appropriate with good confocal and dermoscopy images attached. However, it would be nice to have histological images for correlation as well. The conclusions are sensible and balanced as well. However, it is important to indicate in the case report that the RCM is a useful complementary tool but should not replace clinical judgement on the necessity to closely monitor nevi and still offer excision if in doubt.

Competing Interests: No competing interests were disclosed.

We have read this submission. We believe that we have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

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This is a well described case report on the use of RCM for melanoma and dysplastic nevi evaluation. Clinic, dermoscopic and confocal figures are well presented and clearly described the case.

Competing Interests: No competing interests were disclosed.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

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